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10/523,281

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Kazuhiro Ohba

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EXAMINER

KIJMOWICZ, WILLIAM JOSEPH

ART UNIT

PAPER NUMBER

2627

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/523,281

**Applicant(s)**

OHBA ET AL.

**Examiner**

William J. Klimowicz

**Art Unit**

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

Claim 4 is objected to because of the following informalities and appropriate correction is required.

The following phrase(s) lack clear antecedent basis within the claim(s), i.e., either the particularly recited passage fails to be properly introduced prior to its appearance at that point in the claim or the structure recited in the passage is not an inherent part of or component of the previously recited structure. The lack of antecedence as noted *infra*, is merely formal, since the claims can be understood in light of the instant specification and drawings; the antecedence informalities delineated below do not rise to the level of a rejection under 35 USC 112 2<sup>nd</sup> paragraph:

- (i) Claim 4 (line 6), “said intermediate layer.”

Claims 1 and 4 are objected to because of the following informalities and appropriate correction is required.

With regard to claim 1 (line 5) and with regard to claim 4 (line 7), after the phrase “at least one of the following,” a colon should be inserted.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 6,710,986).

As per claims 1 and 3, Sato et al. (US 6,710,986) discloses a tunnel magnetoresistive device (e.g., see FIG. 2) having: an intermediate layer (310 - tunnel barrier layer made of insulating material); a fixed magnetization layer (e.g., 210 - first magnetic layer - see also, COL. 8, lines 45-56) located directly below and in contact with said intermediate layer (e.g., 310), said fixed magnetization layer (210) is a crystalline ferromagnetic material that is made of an alloy of at least one of the following iron, nickel and cobalt (see, e.g., COL. 3, lines 65 - COL. 4, line 11 - bcc cubic crystal structure, with iron as a component); and a free magnetization layer (110 - e.g., see COL. 8, lines 31-34, and COL. 8, lines 45-46 - wherein the first magnetic layer can have the higher coercivity, and thus the second magnetic layer is the layer with the lower coercivity) located adjacently above said intermediate layer (310), said free magnetization layer is an amorphous ferromagnetic material that is made of an alloy of at least one an iron group element and at least one element selected from the group consisting of element and metalloid elements, rare earth elements and valve metals (as exemplified, e.g., at COL. 12, lines 18-20 - boron and silicon are metalloid elements), wherein, said fixed magnetization layer (210) and said free

magnetization layer (110) are a pair of ferromagnetic layers opposed to each other to obtain variations in magnetoresistance by an electric current flowing in a direction perpendicular to the film plane (see FIG 2, wherein current flows between (110) and (410)).

As per claim 1 (and claim 4, rejected, *infra*), the only difference between the *claimed* invention and Sato et al. (US 6,710,986) - Sato et al. (US 6,710,986) being shown to be structurally and compositionally identical to the claimed structure/composition of Applicant's claim 1 - is merely the *stated goals* of arriving at a desired characteristics of the structure.

That is, although Sato et al. (US 6,710,986) remains silent with respect to the particular claimed ranges or desired results, given the teachings and suggestions of Sato et al. (US 6,710,986) for providing an identically claimed structure, albeit for the desired goals as espoused in a "result [of] a tunnel magnetic resistive (TMR) ratio greater than 45%, a coercivity value less than 6% and a rectangle ratio greater than 90%," using the teachings of Sato et al. (US 6,710,986) as a demonstrative template, it would have been within the skill of one having ordinary skill in the art to routinely modify the MR head of Sato et al. (US 6,710,986) in the course of routine optimization/experimentation and thereby obtain various standard optimized relationships including those set forth in claims 1 and 4 as nothing more than a *predictable variation* based the on the overarching teachings of Sato et al. (US 6,710,986).

That is, given the express conceptual teachings and implied/inferred suggestions of Sato et al. (US 6,710,986) as a whole, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to routinely modify the MR head of Sato et al. (US 6,710,986) in the course of routine optimization/experimentation and thereby obtain various standard optimized relationships including those set forth in claims 1 and 4 in order to arrive at a

prescribed desired goal, *given that Sato et al. (US 6,710,986) identically discloses the claimed invention in terms of structure and composition*, which would satisfactorily provide the desired and advantageous results of a TMR head and thus provide nothing more than a *predictable variation* based on the overarching and pertinent teachings of Sato et al. (US 6,710,986).

It is noted that the Applicant's *claims do not* in any way *distinguish from the prior art* in terms of composition or structure, *just merely in terms of a desired range or goal* of such identically disclosed structure/composition.

Functional language (that is, language that attempts to distinguish over the prior art based solely on its purported capabilities, without distinguishing in terms of composition or structure) that implicitly encompasses *every possible device* that can possibly perform the recited language, lacks sufficient support from the specification. See *Holland Furniture Co. v. Perkins Glue Co.*, 277 U.S. 245 (1982). When an element is defined by functional language (other than means clauses invoking 35 USC 112 6<sup>th</sup> paragraph), the breadth of the functional language must be limited by recitation of some structure or method that supports the claimed function. See *In re Fuller* 35 F.2d 62, 3 USPQ 51 (CCPA 1929). *A claim that recites only a desired end result unattached to any mechanism that is used to achieve that result will be rejected as overly broad because it covers any conceivable means that anyone may ever discover.* See *In re Fuetterer*, 319 F.2d 259, 138 USPQ 217 (CCPA 1963).

As an example, a claim reading, "A woolen cloth having a tendency to wear rough rather than smooth," claims a desired result - that the cloth does not become shiny with wear. See *In re Fuller* 35 F.2d 62, 3 USPQ 51 (CCPA 1929). The claim is overly broad because it does not limit

the functional language by describing the process of manufacturing the cloth, that is, by decreasing the animal grease content and adding silk threads to support a claim to the desired result. The functional language can be limited by describing the structure of the cloth.

When claiming an ingredient of a composition-of-matter or process claim by its function, an overly broad rejection can be avoided if:

- (i) The name of the ingredient is recited, in addition to its function;
- (ii) The function specified does not encompass materials that would not work; and
- (iii) The breadth of the functional language is supported by disclosing numerous alternative materials that are equivalent in function. *Ex Parte Slob* 157 USPQ 172 (Pat. Off. Bd. App. 1967).

A claim that does not meet this standard is:

A liquefiable substance having a liquefaction temperature from between 40°C to about 300°C and being compatible with ingredients in the powdered detergent composition.

This claim was rejected because it did not name the ingredients used, it read on materials such as low melting metals that would not work in the composition, and it was not supported by the disclosure because only a limited number of examples were disclosed. *Id.*

As specifically noted in an opinion rendered by the Board of Patent Appeals and Interferences, *Ex Parte Slob* 157 USPQ 172 (Pat. Off. Bd. App. 1967), a case which has not been overruled, modified, reversed, questioned, superseded or otherwise vacated in any manner, and thus is still *controlling precedent*, as provided in the Headnotes section:

Claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing

or which might be discovered in future and which would impart desired characteristics; thus, expression “a liquefiable substance having a liquefaction temperature from about 40°C to about 300°C and being compatible with the ingredients in the powdered detergent composition” is too broad and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and, in effect, recites compounds by what it is desired that they do rather than what they are; expression also is too broad since it appears to read upon materials that could not possibly be used to accomplish purposes intended.

In the instance situation, the fact pattern is substantially identical to the issues raised and addressed by the Board of Patent Appeals and Interferences in *Ex Parte Slob*. That is, in claims 1 and 4, the recitation of “result in a tunnel magnetic resistive (TMR) ratio greater than 45%, a coercivity value less than 6% and a rectangle ratio greater than 90%” merely sets forth physical characteristics desired in the article (e.g., “MR head”) but does not set forth specific compositions, which would define over the prior art - since the Examiner has shown that Sato et al. (US 6,710,986) is identical to the claimed invention (e.g., claim 1) except for recited desired characteristics (“result in a tunnel magnetic resistive (TMR) ratio greater than 45%, a coercivity value less than 6% and a rectangle ratio greater than 90%”) which would meet such characteristics.

The Examiner, however, will not go so far as to consider the claim(s) “indefinite” for being too broad (as the BPAI did in *Ex Parte Slob*), but merely demonstrate to the Applicant that the claim is just that - overly broad- and as such, is met by Sato et al. (US 6,710,986) and the general knowledge of one having ordinary skill in the art, and *until the claim is modified to compositionally or otherwise structurally* define over Sato et al. (US 6,710,986), *the claim will be considered unpatentable.*



Additionally, the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found.

It furthermore has been held in such a situation, the Applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

Additionally, the following 35 USC 103(a) rejections are being made in light of a recent Supreme Court opinion.

The Supreme Court has issued its opinion in *KSR*, regarding the issue of obviousness under 35 U.S.C. 5 103(a) when the claim recites a combination of elements of the prior art. *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007).

In the decision, the Court reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. 5 103(a), inclusive of the four factual inquiries under Graham, which are:

- (a) determining the scope and contents of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and

(d) evaluating evidence of secondary consideration.

*Graham v. John Deere*, 383 U.S. 1, 17-18, 148 USPQ 459,467 (1966).

It is noted that the Court did not totally reject the use of “teaching, suggestion, or motivation” as a factor in the obviousness analysis. Rather, the Court recognized that a showing of “teaching, suggestion, or motivation” to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. 103(a).

More noteworthy, however, the Court rejected a rigid application of the “teaching, suggestion, or motivation” (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

The Court noted that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. The Court specifically stated:

Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an *apparent reason* to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis *should be made explicit*.  
*KSR*, slip op. at 14 (emphasis added).

No new or unobvious result is seen to be obtained, given the express teachings and motivations, as espoused by Sato et al. (US 6,710,986), and as such, the claimed ranges (or, more concretely, the desired results) are seen, absent any unobvious evidence, as nothing more than a ***predictable variation*** based the on such overarching and pertinent teachings of Sato et al. (US 6,710,986), in light of the general knowledge of an artisan having ordinary skill in the art, with the express rationale provided *supra*. See *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007).

Moreover still, the Supreme Court opined “[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a ***predictable variation***, § 103 likely bars its patentably.” (Emphasis added) 127 S. Ct. 1727, 1740.

As per claim 2 (and claim 5, rejected, *infra*), although Sato et al. (US 6,710,986) does not expressly disclose wherein the magnetoresistive device has a laminated ferri structure, Official notice is taken that such ferri-laminated structures associated with either the free or pinned layers are notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a conventionally laminated ferri structure to the head of Sato et al. (US 6,710,986), as is widely known in the MR art.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide a conventionally laminated ferri structure to the head of Sato et al. (US 6,710,986), as is

widely known in the MR art in order to, *inter alia*, mitigate the magneto-static coupling between the pinned layer and the free layer, as is well known, established and appreciated in the art.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatke et al. (US 6,842,361 B2) in view of Sato et al. (US 6,710,986).

See the description of Sato et al. (US 6,710,986), *supra*.

As per claim 4, Miyatke et al. (US 6,842,361 B2) discloses a magnetic memory apparatus (12) comprising: a magnetoresistive device (38) having a pair of ferromagnetic layers (32, 36) opposed to each other to obtain variations in magnetoresistance by an electric current flowing to the direction perpendicular to the film plane; a word line (50) and a bit line (46) sandwiching said magnetoresistive device (38) in the thickness direction, wherein said magnetic memory apparatus includes said pair of ferromagnetic layers (32, 36) composed of a magnetization fixed layer (36) made of a ferromagnetic layer provided under an intermediate layer (34) and a magnetization free layer (32) being made of a ferromagnetic layer being provided above said intermediate layer (34).

As per claim 4, however, Miyatke et al. (US 6,842,361 B2) does not expressly disclose wherein the magnetization fixed layer (36) made of a crystalline ferromagnetic layer and wherein the magnetization free layer is made of an amorphous ferromagnetic layer, as particularly set forth and described in claim 4.

Sato et al. (US 6,710,986), however, discloses an analogous magnetoresistive device having such structure - see the description of Sato et al. (US 6,710,986), *supra*.

Given the express teachings and motivations, as espoused by Sato et al. (US 6,710,986), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetization fixed layer of Miyatke et al. (US 6,842,361 B2) as being made of a crystalline ferromagnetic layer and the magnetization free layer is made of an amorphous ferromagnetic layer, as expressly suggested by Sato et al. (US 6,710,986).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the magnetization fixed layer of Miyatke et al. (US 6,842,361 B2) as being made of a crystalline ferromagnetic layer and the magnetization free layer is made of an amorphous ferromagnetic layer, as expressly suggested by Sato et al. (US 6,710,986) in order to “provide a magnetic memory which is non-volatile and is capable of reading and writing data at a high speed.” See, *inter alia*, COL. 2, lines 27-30 of Sato et al. (US 6,710,986).

As per the rejection of claim 5, see the discussion of claim 2, *supra*.

As per the rejection of claim 6, see the discussion of claim 3, *supra*.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (571) 272-7577. The examiner can normally be reached on Monday-Friday (7:30AM-6:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph H. Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/William J. Klimowicz/  
Primary Examiner, Art Unit 2627